

The Classification of the Lithurginae (Hymenoptera: Megachilidae)¹

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The Lithurginae is a small world-wide subfamily of Megachilidae, with its maximum diversity in the arid temperate parts of South America. Its position relative to related groups of bees is indicated in Fig. 1. The synapomorphies shown in the figure and in Table 1 are not an exhaustive list but only enough to establish the cladistic relationships and to characterize the major taxa related to the Lithurginae. Peters (1972) has provided a similar list and come to conclusions similar to mine, although he did not consider the diversity of Lithurginae here discussed. The Fideliidae are considered as a subfamily of Megachilidae by Rozen (1977) and this position for that group may be quite appropriate. My placement of it here as a family does not indicate a strong conviction as to its status.

The definition of the Lithurginae given by Michener (1944) is not correct, as noted by Moure (1949). (In 1944 I had not seen South American material of the subfamily, and my comments were based on a limited sample of the species of the genus *Lithurge*.) Thus the jugal lobe of the posterior wing, while generally longer in Lithurginae than in Megachilinae, is only half as long as the vannal lobe in *Trichothurgus colloncurensis* Ogloblin. The hindtibiae lack spicules in many males and the spicules are weak, especially in *Trichothurgus*. The face of the female is often not elevated below the antennal sockets in *Trichothurgus*. The epistomal suture is often complete, even in some species of *Lithurge*. Finally, in *Trichothurgus* the lowest rather than the middle mandibular tooth is often longest and the middle one is not always advanced in front of the others, as in *Lithurge* and *Microthurge*.

Characteristic features of Lithurginae include the following: *Synapomorphies*: Characters 8 to 14, Table 1. *Plesiomorphies*: Jugal lobe of hindwing half to three fourths as long as vannal lobe. Basitibial plate usually defined along posterior margin and at apex in female, but not evident in several species of *Trichothurgus*. Metasoma of male not curled under at apex as in most megachilids; sixth tergum without transverse carina, teeth, and the like; seventh tergum fully exposed and directed posteriorly. Six sterna fully exposed. Pygidial plate of female represented by a longitudinal, dorsal, bare zone on sixth tergum, extended posteriorly as flat or concave dorsal surface of apical tergal projection or spine, sometimes expanded at apex; of male a broader plate, margined laterally by carinae, often pointed apically and quite slender, almost like an apical tergal spine.

A common feature of the subfamily found in females of nearly all *Lithurge*, all

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This paper is dedicated with pleasure and enthusiasm to Dr. Richard M. Bohart, in recognition not only of his seventieth birthday but of his life-long work as a hymenopterist and as a teacher of systematic entomology. A new species, *Microthurge boharti*, is named in his honor.

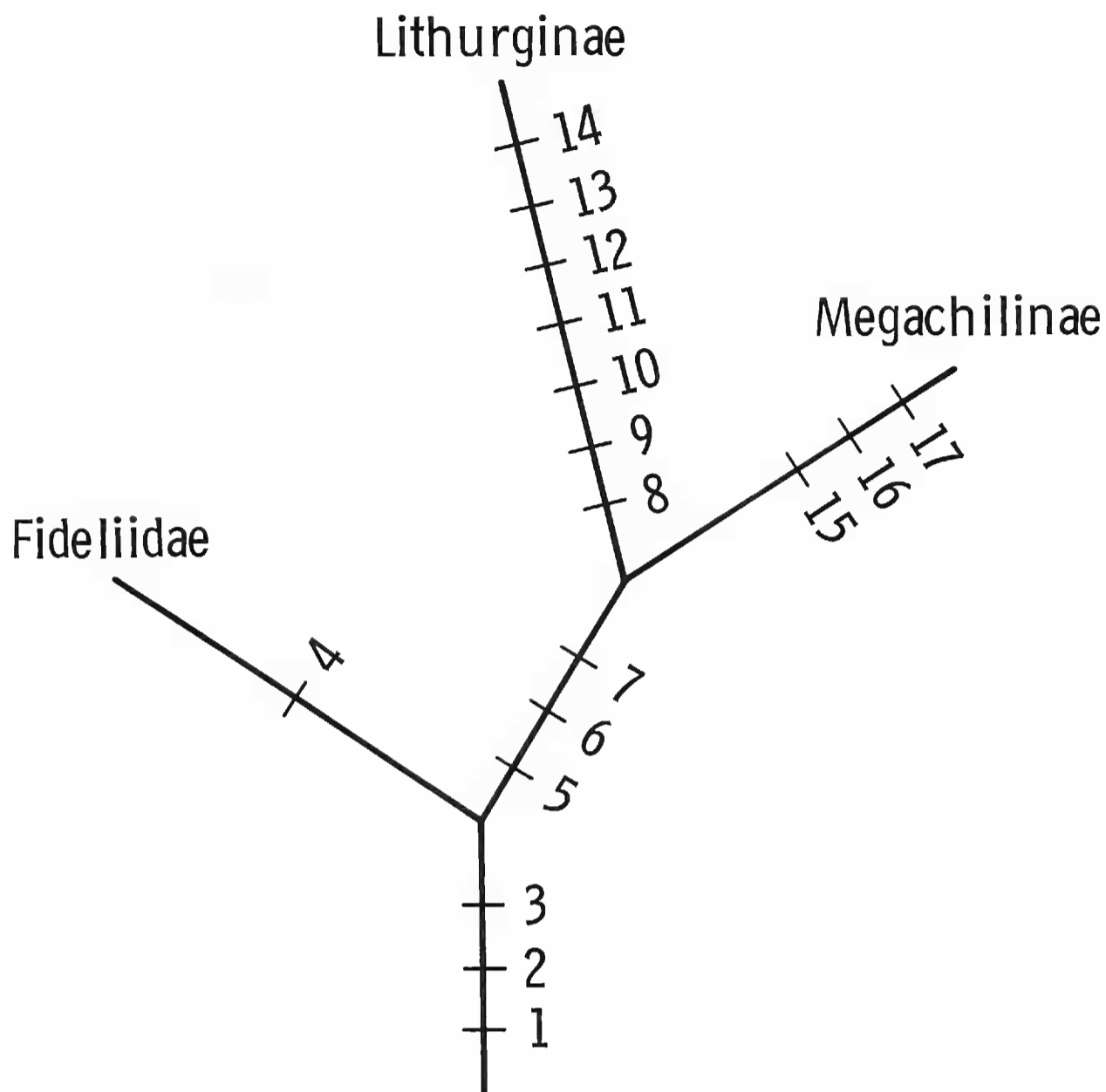


Fig. 1. Cladogram showing the position of Lithurginae. Numbers represent the apomorphies listed in Table 1.

Microthurge, and a few *Trichothurgus*, and in males of a few species of *Lithurge* (e.g., *L. fortis* Cockerell) and *Microthurge*, is a facial prominence. This is an elevation near the median segment of the epistomal suture. Sometimes the suture, if discernible, is largely above it so that the prominence is on the upper part of the clypeus or largely so [*T. osmioides* (Friese), *wagenknechti* (Moure)]; *L. rubricatus* Smith). Sometimes the suture is below it, so that the prominence is on the supraclypeal area or largely so [*T. dubius* (Sichel), *Lithurgopsis*, *Microthurge*]. In still others both areas are involved, so that the suture goes across the prominence (*L. sparganotes* Schletterer, *atratus* Smith, *scabrosus* Smith, etc.).

Other features useful in recognizing the subfamily are the tridentate mandibles, with the middle tooth the longest except in *Trichothurgus*. Arolia are absent or nearly so in all females and some males.

Another interesting feature of the subfamily is the structure of the apex of the labial palpus. Attached to the end of the very long second segment is the small, flattened third segment, which continues in the same direction as the second and is often somewhat pointed. Only the fourth segment, when present, diverges from the axis of the preceding segments. In most long-tongued bees both third and

Table 1. Synapomorphies indicated in Fig. 1, with explanations or plesiomorphies in parentheses.

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1. Labrum longer than broad. (The labrum is broader than long in other bees, with the exception of some Nomadinae which must have evolved the elongate labrum independently.)
 2. Scopa on metasomal sterna, not on legs. (No other bees have this feature although some short-tongued bees have sternal in addition to leg scopal hairs.)
 3. Hairy larval bodies. (Most other bees have bare larvae or larvae with only a few minute spicules. Exceptions are allodapine anthophorids which must have evolved hairs independently.)
 4. Hindbasitarsus with long hairs used in flicking soil away from nest entrance. (Not found in other bees.)
 5. Two submarginal cells. (Three is widespread, although reduction to two occurs in many bees.)
 6. Seventh metasomal sternum of male reduced, without large apical lobes. (Seventh metasomal sternum produced to paired thin apical lobes, a widespread feature of short-tongued and some long-tongued bees.)
 7. Volsellae lost or fused to form lobes on gonocoxites; opposable digitis and cuspis not recognizable or at least not moveable. (Although volsellar reduction is common, volsellae are separate sclerites, each with digitis and cuspis, in most bees.)
 8. Proboscis elongate, in repose often reaching metasoma. (With few exceptions other megachilids have shorter proboscides.)
 9. Third segment of labial palpus flattened, on same axis as second. (Third segment directed laterally in nearly all other long-tongued bees.)
 10. Outer surfaces of tibiae, except hindtibiae of some males, with coarse hairless spicules. (Spicules if present bearing an apical hair.)
 11. Hindbasitarsi slender, almost cylindrical. (The hindbasitarsi are flattened in most bees, at least in females.)
 12. First metasomal tergum small, flattened, posterior margin rounded. (In other bees this tergum is more convex in profile with anterior and dorsal surfaces, and has the posterior margin transverse.)
 13. Posterior margin of sixth tergum of female with strong sublateral tooth, completely hidden in dense hair in *Trichothurgus*. (Such teeth are absent in other megachilids.)
 14. Male genitalia and hidden sterna extraordinarily small. (In other bees these structures are larger and commonly more heavily sclerotic as well as more ornate.)
 15. Basitibial plate completely lost. (Such loss is also common in other bees, although the plate is widespread and presumably plesiomorphic.)
 16. Jugal lobe of hindwing less than half as long as vannal lobe. (The jugal lobe is half or commonly much more than half as long as the vannal lobe in many bees although reduction also occurs in many groups other than megachilids.)
 17. Pygidial plate and pygidial fimbria absent. (Both are present in most bees, although independently lost in various groups; in Fideliidae they may also be lost although the condition found in that group may result from great expansion of the plate.)
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fourth segments diverge, although *Prochelostoma* in the Megachilinae resembles the Lithurginae in this feature. The fourth segment of the labial palpus is sometimes absent. It is certainly easily broken off, but seems to be actually absent in males of *Trichothurgus laticeps* (Friese), in all specimens of *Microthurge* examined, and in some Old World species of *Lithurge* (see below).

KEY TO GENERA OF LITHURGINAE

1. Labrum longer than clypeus, often much longer. Hindtibia of female rather uniformly hairy on outer and anterior and posterior surfaces, spicules relatively inconspicuous among hairs. Lower mandibular tooth longer than middle tooth or in some females, lower and middle teeth equal.
 *Trichothurgus*

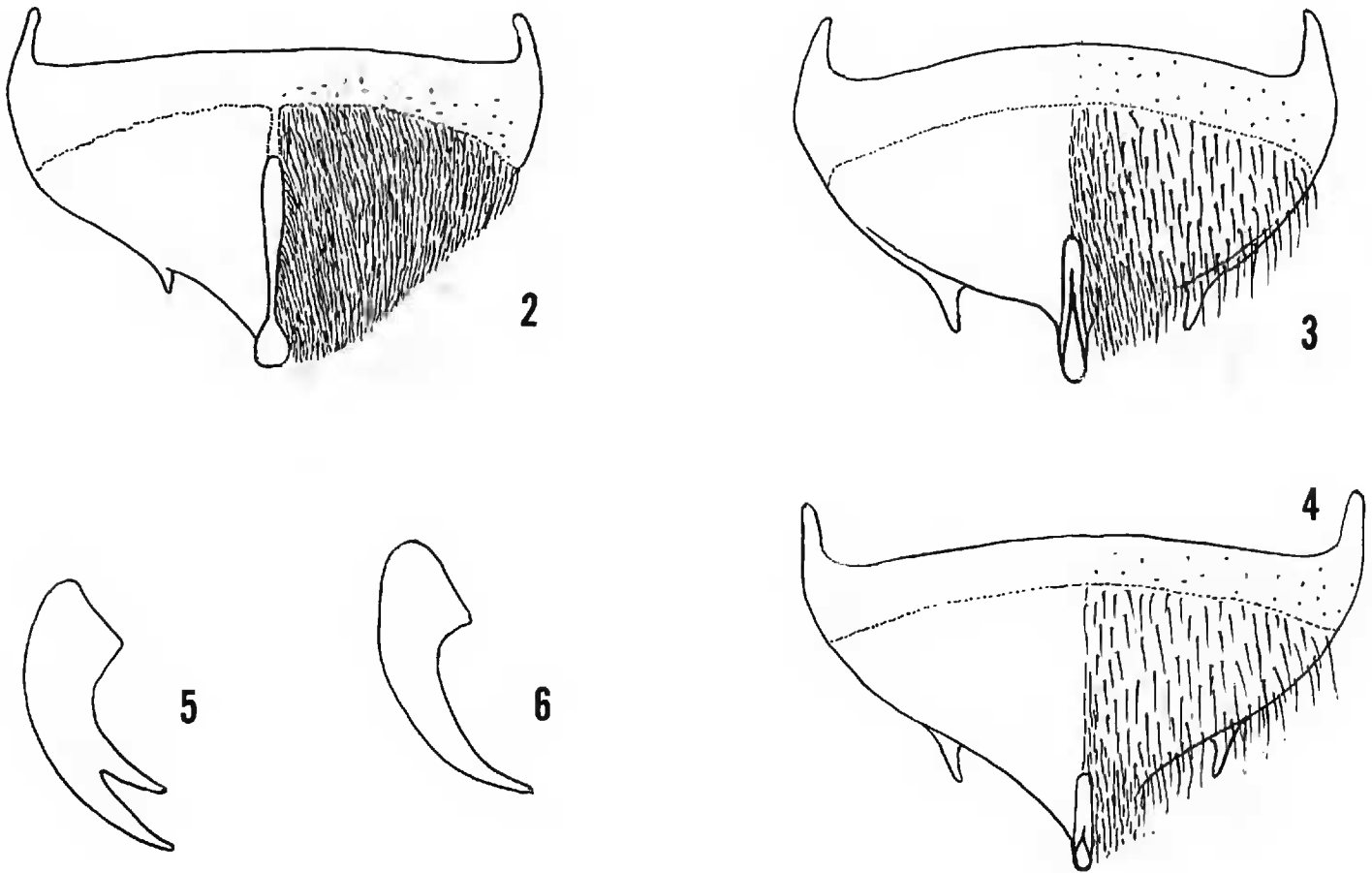
- Labrum about as long as clypeus. Hindtibia of female with hairs of broad, longitudinal outer zone shorter and sparser than those of anterior and posterior surfaces, spicules large and conspicuous in outer zone. Lower mandibular tooth conspicuously shorter than middle tooth, which is longest mandibular tooth: 2
- 2. Body small, slender, heriadiform; claws of female bifid; stigma of moderate size, broadest at base of vein r, sides converging toward base; maxillary palpi 2-segmented. *Microthurge*
- Body broad, megachiliform; claws of female simple; stigma small, sides basal to vein r parallel or nearly so; maxillary palpi 3- or 4-segmented. *Lithurge*

Moure (1949) placed *Trichothurgus* (with *Lithurgomma*) in a separate tribe, the Trichothurgini. While it is the most distinctive genus of Lithurginae, I see no need to segregate it as a tribe, and follow Snelling (in press) in not doing so. Most of its characters are plesiomorphies or probable plesiomorphies. The large and elongate labrum, however, appears to be a synapomorphy uniting the species of *Trichothurgus*, which can be regarded as a sister group to the other two genera combined. The sparsely hairy wing membrane is probably also a synapomorphy although this character arises independently in various other bees.

Lithurge and *Microthurge* agree in several synapomorphies: the reduced lower mandibular tooth such that the middle tooth is longest as well as more anterior than the others, the coarse tibial spicules in areas of short and sparse hairs, the low profile of the posterior part of the thorax and especially of the propodeum, the median apical pygidial spine of the female, the strong tooth lateral to this spine on the posterior margin of tergum VI. Compared to *Trichothurgus* with its many plesiomorphies, *Lithurge* and *Microthurge* have few, the most noteworthy, perhaps, being the ordinary sized labrum and the moderate to high density of hairs on the wing membrane.

Microthurge has few apomorphies. These include the short maxillary palpi and perhaps the larger stigma (plesiomorphic for Apoidea as a whole, no doubt, but perhaps derived in connection with small body size in this genus as well as in some related small megachilids such as *Chelostoma* and *Heriades*). Bifid claws in females (Fig. 5) are considered a plesiomorphy by Peters (1972) in other megachilids, probably correctly, but could be an apomorphy in *Microthurge*. Genes for this character must be retained in all species, because the claws of males are cleft. A minor regulatory change could therefore cause their reactivation in females, and would be apomorphic. The broad pygidial plate of males of *Microthurge* (Fig. 8) seems to be plesiomorphic, as compared to all other megachilids, but one must question this idea in view of the slender produced plate in both *Trichothurgus* and *Lithurge* (Fig. 7). If this similarity is due to homology, then the broad plate of male *Microthurge* is a reversion toward the more primitive apoid condition, but for this genus it would be an apomorphy.

For *Lithurge* the situation is equally confusing. If the stigmal, claw, and pygidial characters listed above are plesiomorphic for *Microthurge*, then the alternative characters are apomorphic for *Lithurge*. Regardless of such matters, there is enough phenetic difference between *Lithurge* and *Microthurge* to justify generic status for them both.



Figs. 2–6. 2–4, sixth metasomal terga of females; 2, *Trichothurgus wagenknechti*, 3, *Lithurge apicalis*, and 4, *Microthurge pharcidontus*. 5, 6, claws of females; 5, *Microthurge pharcidontus* and 6, *Lithurge apicalis*.

The long, slender arolia in males of Lithurginae are of interest. No doubt their presence is plesiomorphic; they occur in both sexes of most bees, but are absent in female lithurgines. They are present in males of *Trichothurgus*, in the Western Hemisphere subgenus *Lithurgopsis* of *Lithurge*, and in one Australian species, *Lithurge (Lithurge) rubricatus* Smith. They are absent in the rest of the genus *Lithurge* and in *Microthurge*.

Genus *Trichothurgus* Moure

(Fig. 2)

Trichothurgus Moure, 1949:240. Type species: *Megachile dubia* Sichel, by original designation.

Lithurgomma Moure, 1949:277. **New synonym.** Type species: *Lithurgomma wagenknechti* Moure, by original designation.

Commonly robust, hairy bees without metasomal hair bands. Facial prominence commonly absent, present in females of *T. dubius* (Sichel) (clypeal); *osmioides* (Friese), *pseudocellatus* (Moure), and *wagenknechti* (Moure) (all supra-clypeal). Epistomal suture complete. Labrum longer than clypeus, sometimes as long as distance from clypeal apex to anterior ocellus. Mandible with lower tooth longer than median tooth or in females of some species, these two teeth subequal. Maxillary palpus 3-segmented; labial palpus 4-segmented or fourth segment sometimes missing. First flagellar segment over twice as long as greatest breadth [less than twice as long in *osmioides* (Friese)], second much shorter than first and usually distinctly broader than long. Tibiae with anterior, outer, and posterior

surfaces rather uniformly hairy; fore and middle tibiae each with row of small spines or spicules extending basad on posterior outer surface from each of the two apical tibial spines, these rows limited to distal part of tibia and absent in some males; hindtibia with similar spicules scattered among hairs of outer surface in females but not in males. Arolia of male distinct, long, slender (as in *Lithurgopsis*). Claws of female simple. Hindbasitarsus of female subequal to tibia or usually shorter. Stigma small, slender, sides basal to vein r parallel. Wing membrane bare or with sparse hairs. Profile of first metasomal tergum with basal concavity less horizontal than dorsal surface. Pygidial plate of female a dorsal strip on tergum VI, usually slightly expanded at apex, not projecting as a spine; of male a dorsally flat or concave, broad, blunt projection or robust spine, similar to that of *Lithurge* but often hidden by long hair from adjacent parts of tergum. Tergum VI of female with apical tooth at each side small and hidden in the dense hairs (Fig. 2).

This genus is known from Chile, Argentina, and Peru. At least some species visit flowers of Cactaceae for pollen. They range from very large (up to 21 mm long, *T. dubius* (Sichel)) to rather small (7 mm long, *T. colloncurensis* Ogloblin). The following species are placed in this genus: *albiceps* (Friese), 1908; *?alpestris* (Friese), 1923; *aterrimus* (Cockerell), 1926; *colloncurensis* Ogloblin, 1957; *dubius* (Sichel), 1867; *herbsti* (Friese), 1905 (= *muticus* (Herbst), 1918); *holomelan* (Moure), 1949; *laticeps* (Friese), 1906; *neoqueenensis* (Friese), 1910; *osmioides* (Friese), 1910; *pseudocellatus* (Moure), 1949; *shajovskoyi* Ogloblin, 1957; *wagenknechti* (Moure), 1949.

The name *Lithurgomma* was proposed for certain species in which there is a defined impunctate area in front of the anterior ocellus. The size and sharpness of definition of this area varies and intergradation to typical *Trichothurgus* thus seems to occur. Moreover, other features do not show close relationship among the forms having such an area. I therefore see no justification for recognition of *Lithurgomma* as a genus or even as a subgenus, a viewpoint supported by Snelling (in press).

Microthurge Michener, NEW GENUS

(Figs. 4, 5, 8)

Type species: *Lithurgus pharcidontus* Moure.

Small, slender species having the form of a large *Heriades* or one of the small species of *Chelostomoides*; metasomal terga with apical pale hair bands. Facial prominence present in females, weakly so in some males, supraclypeal. Labrum as long as clypeus. Mandible with middle tooth longest. Maxillary palpus extremely short, 2-segmented; labial palpus 3-segmented (fourth segment absent). First flagellar segment less than twice as long as greatest width but over twice as long as second segment which is at least twice as broad as long. Tibiae, especially hindtibia, with shorter hairs on outer surface than on anterior and posterior surfaces and with strong spicules arranged as in *Lithurge*, present in males but more strongly developed in females. Arolia of male absent. Claws of female bifid. Hindbasitarsus of female about as long as tibia. Stigma larger than in other genera, sides basal to vein r diverging toward apex. Wing membrane with dense short hairs. Profile of first metasomal tergum as in *Lithurge*. Pygidial plate of female represented by flat upper surface of short apical spine of tergum VI; of male a

broad triangle, nearly pointed apically, not or but little extending beyond rest of tergum VII. Tergum VI of female with strong apical, marginal tooth at each side, not hidden in dense hairs.

Distribution.—This genus occurs in Argentina, Bolivia, and probably southern Brazil. The following species are included: *boharti* new species, *pharcidontus* (Moure), 1948; *pygmaeus* (Friese), 1908; and probably *corumbae* (Cockerell), 1901.

Discussion.—*Microthurge* is more similar to *Lithurge* than to *Trichothurgus*, as shown by the labral size, the large median mandibular tooth of both sexes, the tibial vestiture and spiculation, the densely hairy wings, the profile of the first tergum, and the apical spine and sublateral apical teeth of tergum VI of the female. It differs not only from *Lithurge* but also from *Trichothurgus*, however, by its small, slender form, the short two-segmented maxillary palpus, the cleft claws of the female, the larger pterostigma, the short apical spine of tergum VI of the female, and the broad rather than apically produced pygidial plate of the male. From other Western Hemisphere Lithurginae (except the possibly adventive *Lithurge huberi* Ducke), *Microthurge* differs by the lack of arolia in the male.

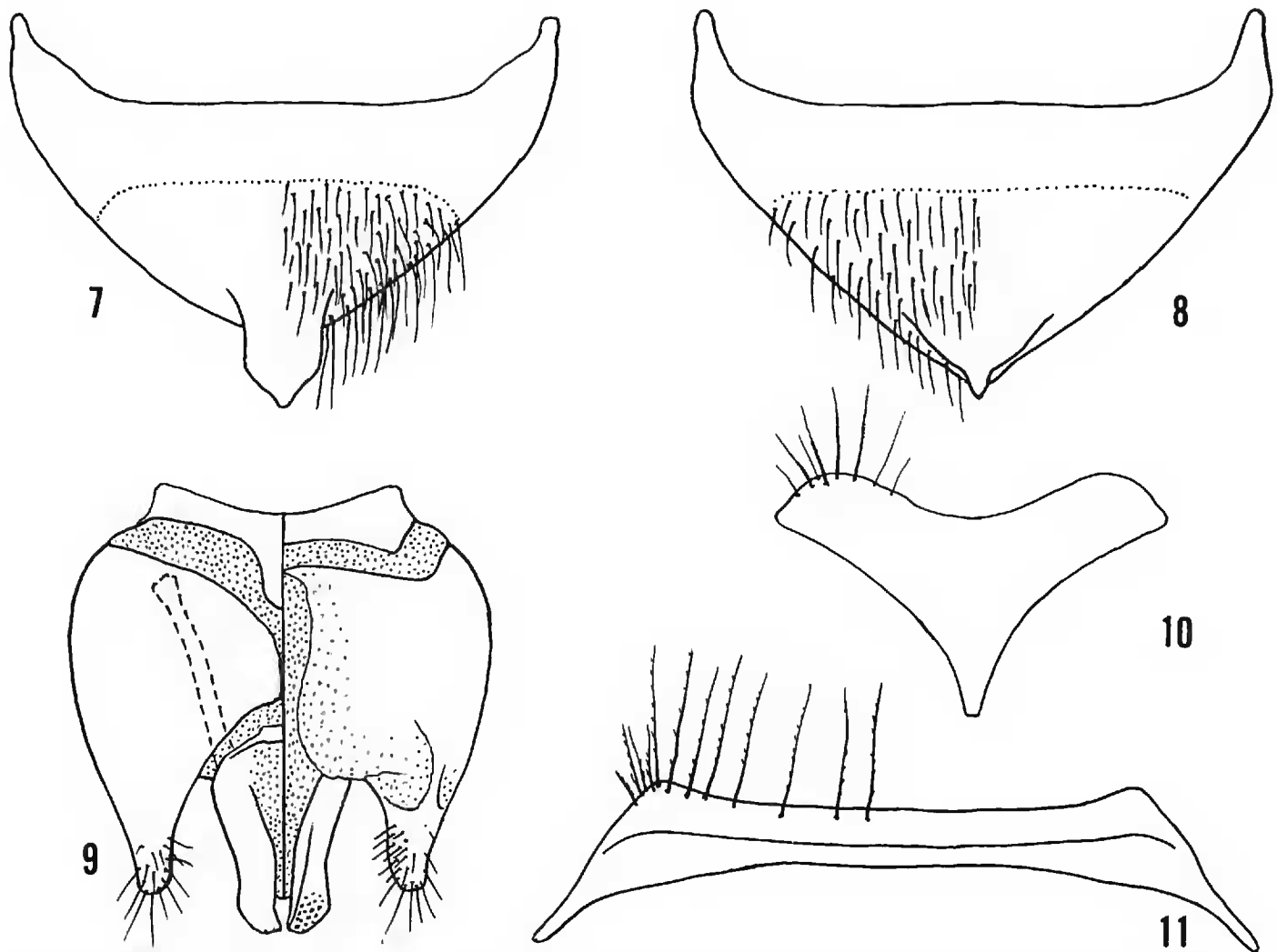
Etymology.—The generic name, formed in the manner of Padre J. S. Moure in naming *Trichothurgus*, is from *micro*, small, plus part of the generic name *Lithurge*.

Genus *Lithurge* Latreille

(Figs. 3, 6, 7, 9–11)

Robust but with metasoma somewhat flattened, commonly with hair bands. Facial prominence almost always present in females, absent in most males (present in males of *L. fortis*, etc.). Epistomal suture present or absent in females between tentorial pits. Labrum about as long as clypeus. Mandible with middle tooth longest. Maxillary palpus 3- to 4-segmented; labial palpus 4-segmented except in certain Old World species that lack fourth segment. First and second flagellar segments variable. Tibiae, especially posterior one, with hairs shorter on outer surface than on posterior surface. Fore and middle tibiae in female each with two longitudinal rows of coarse spicules extending basad on posterior part of outer surface from each of the two apical tibial spines, these rows outlining a channel on each tibia between rows which extends to the middle of the tibia or beyond nearly to base; sometimes some spicules between the rows; in male spicules smaller, rows shorter, sometimes absent. Hindtibia of female with coarse spicules scattered over short-haired outer surface; spicules smaller in males, absent in many species, present but small in *Lithurgopsis*. Arolia of male present or absent. Claws of female simple. Hindbasitarsus of female slightly shorter than to longer than tibia. Stigma small, sides basal to vein r parallel or nearly so. Wing membrane hairy, often densely so. Profile of first metasomal tergum with dorsal surface almost a direct continuation in a straight line from surface of basal concavity. Pygidial plate of female a flat or concave dorsal surface of long apical spine of tergum VI; of male a dorsally concave, broad, blunt projection or robust spine. Tergum VI of female with strong apical, marginal tooth at each side, not hidden in dense hairs; pygidial plate of male a broad flat-topped apical pointed projection.

This genus is world-wide in distribution in tropical and warm to moderate



Figs. 7-11. 7, 8, seventh metasomal terga of males; 7, *Lithurge apicalis* and 8, *Microthurge pharacidontus*. 9-11, *Lithurge apicalis*, male; 9, genitalia (dorsal side on left), 10, eighth sternum, 11, seventh sternum.

temperate zones, except that in the Americas it may be largely absent from the wet tropics. Two subgenera are commonly recognized, as follows.

Subgenus *Lithurge* Latreille, s. str.

Lithurge Latreille, 1825:463. Type species: *Andrena cornuta* Fabricius (monobasic).

Lithurgus Berthold, 1827:467. An emendation of *Lithurge*, hence type species automatically the same.

Arolia absent or rudimentary in both sexes (see Cockerell, 1905) except for *L. rubricatus* (from Australia) in which arolia of the male are as large and long as in male *Lithurgopsis*. Facial prominence of female involving upper part of clypeus and usually also part of supraclypeal area. First flagellar segment about twice as long as broad, more than twice as long as second, which is much broader than long.

This subgenus is found in Eurasia, Africa, Australia and intervening islands and includes all of the Old World species of the genus. In Africa it reaches the Cape, in Australia, New South Wales but is apparently absent from southern parts of the continent, while in Eurasia it extends north to Japan, China, Hungary, Spain, etc. To the east it occurs as far as Tahiti, perhaps having been carried by

primitive boats. One species, *L. huberi* Ducke, occurs in Brazil; it is probably the same as one of the Old World species and adventive in Brazil (Snelling, in press). Another species, *L. chrysurus* Fonscolombe, has been recorded by Roberts (1978) as introduced presumably from the Mediterranean region into New Jersey.

L. rubricatus Smith does not agree with *Lithurgopsis* except in the presence of long arolia in the male. Such arolia may be a primitive feature that survived in Australia and the Americas while being replaced in the rest of the world by forms lacking such arolia in both sexes.

While some species of this subgenus collect pollen from Malvaceae which have coarse pollen like that of the Cactaceae used by the subgenus *Lithurgopsis*, other species collect fine pollen of Compositae and perhaps other flowers. There may be morphological correlates with the type of flowers visited for pollen. Thus most species have coarse (malvaceous?) pollen on them and have the proboscis long, with the fourth segment of the labial palpus present. A few species have fine (composite?) pollen on them and have the proboscis shorter, with the fourth segment of the labial palpus absent. Such species are *L. chrysurus* Fonscolombe, *capensis* Friese (= *ovatus* Cameron), and *fuscipennis* Lepeletier.

Latreille's original spelling (1825) of the genus and subgenus name has been used here, although it has been regarded by many authors as French vernacular (e.g., Fox, 1902). Such authors use the emended Latinized form *Lithurgus*, introduced by Berthold (1827) when he translated Latreille's work into German. The spelling *Lithurge*, as noted by Fox (1902), was used by Lepeletier (1828:795) but by few subsequent authors. However, it was shown as the correct name by Sandhouse (1943) in her treatment of apoid generic names, and has since been used by Michener (1944, 1951) and Hurd (1979) in major studies and catalogues, as well as in shorter papers by various authors.

Subgenus *Lithurgopsis* Fox

Lithurgus (*Lithurgopsis*) Fox, 1902:138. Type species: *Lithurgus apicalis* Cresson (original designation).

Male with arolia. Facial prominence of female entirely supraclypeal (absent in one species being described by Snelling, in press). First flagellar segment not or little longer than broad, slightly longer than to shorter than second, which is nearly as long as broad to longer than broad.

This subgenus is limited to the Western Hemisphere, where it ranges from South Dakota to Argentina, but is absent from broad areas in the tropics. It collects pollen from Cactaceae. Snelling (in press) has reviewed the North American species.

APPENDIX

Below I establish a lectotype for a name in *Trichothurgus*, and present descriptions of the species of *Microthurge* available to me.

Trichothurgus herbsti (Friese)

Moure (1949) apparently correctly placed *Lithurgus muticus* Herbst, 1918, in the synonymy of "*Megachile*" *herbsti* Friese, 1905. Two males and two females of *Lithurgus muticus* Herbst are in the Museum of Comparative Zoology, Harvard

University, and evidently are cotypes, no holotype or lectotype having been designated. All are labelled Chile, Rio Blanco, P. Herbst; one female XII-10-17, one male and one female XII-11-17, and one male XII-26-17. The females and the male taken on XII-10 all bear the label "in floribus *Echinocactus ceratites* Otto," while the remaining male, probably taken on another flower, is labelled "Herbarium No. 46." Each also bears Herbst's label "*Lithurgus muticus* P. Herbst, Type" (the sex also being indicated on this label) and a red label "MCZ Type 17207." Herbst described the female first and in greater detail than the male; I therefore designate and have labelled the female taken on XII-10 as the lectotype.

***Microthurge pygmaeus* (Friese), NEW COMBINATION**

Lithurgus pygmaea Friese, 1908:62.

Female.—Upper margin of base of mandible just below lateral part of anterior clypeal margin with large, dorsoventrally flattened projection extending anteroventrally (projection described as clypeal by Friese, 1908); apex of facial protuberance a transverse, shining carina over one third as long as width of face at that level and much nearer to antennal bases than is anterior ocellus; mesoscutum punctate, finely and closely so around margins, somewhat more coarsely and less closely so on disc.

Male.—Upper margin of clypeus with interspaces between punctures broader than elsewhere, forming a shining transverse band, sometimes weak; supraclipeal area slightly elevated and with a small tubercle on each side; shiny transverse basal zone of labrum uniform in convexity.

This species was described from Mendoza and is widespread in Argentina, as indicated by the following collecting data from specimens in the Snow Entomological Museum, University of Kansas. *Buenos Aires Prov.*: Villa Elias, Feb., 1955 (J. Foerster); Ing. R. Otamendi, Nov., 1954 (F. H. Walz); Tigre, Nov. 3-10, 1956; Dique, Luján, Nov., 1954 (F. H. Walz). *Entre Ríos Prov.*: Villaguay, Nov. 20, 1951 (J. Foerster). *Misiones Prov.*: Obera, Oct. 17, 1950 (M. Senkute). *Tucumán Prov.*: 20 km W. of S. M. de Tucumán, Dec. 10, 1971 (D. J. Brothers).

***Microthurge pharcidontus* (Moure), NEW COMBINATION**

Lithurgus pharcidontus Moure, 1948:321.

Female.—Mandibular projection absent; apex of facial protuberance shining, transverse, slightly emarginate medially seen from above, less than one third as wide as face at that level, almost as far below antennal bases as median ocellus is above; mesoscutum finely and closely punctate around margins, but broad median transverse zone between tegulae coarsely, transversely rugosopunctate, several transverse rugae particularly strong.

Male.—Unknown (see below).

This species was described from Tarancas, San Pedro de Colalao, Tucumán Prov., Argentina. Specimens from that locality, collected in December and February by P. J. M. Arnau and J. Foerster, are at hand. Additional specimens are from: ARGENTINA: *Tucumán Prov.*: El Cadillal; Oct., 1951 (J. Foerster). BOLIVIA: *Cochabamba Prov.*: Feb., 1952 (F. H. Walz).

A male that might be this species is from Guayaramerin, El Beni, Bolivia, Dec. 6, 1956 (M. Fritz). It is similar to that of *M. pygmaeus* but the upper part of the

clypeus is densely punctate; the shiny transverse basal zone of the labrum is distinctly prominent medially, not uniformly convex; the eyes, unlike those of other known species, are closer together below, separated by little more than the maximum ocular width; and the facial hairs are more golden.

Microthurge boharti Michener, NEW SPECIES

Female.—Length 8 mm (varying to 6 mm among paratypes); forewing length 6 mm (varying to 5 mm). Mandibular projection absent; apex of facial projection bilobed, shining laterally but punctate medially, less than one third as wide as face at that level, about two-thirds as far below antennal bases as median ocellus is above; mesoscutum similar to that of *M. pygmaeus* but disc slightly more coarsely and less closely punctate.

Male.—Length 7 mm, forewing length 6 mm. Upper margin of clypeus densely punctate like adjacent areas; supraclypeal area as described for *M. pygmaeus*; shiny transverse basal zone of labrum slightly prominent medially (sometimes only feebly so), not uniformly convex.

Types.—Holotype ♀, allotype ♂, and seven ♀ and one ♂ paratypes: ARGENTINA: *Cordoba Prov.*, Isla Martín García, Jan., 1943 (M. J. Viana). One ♀ paratype: *Cordoba Prov.*, Valle Hermoso (M. J. Viana). One ♂ and one ♀ paratype: *Cordoba Prov.*, Huerta Grande, Jan., 1941 (F. M. Walz). One ♀ paratype: labelled merely "Argentina." A series of specimens of both sexes in the Los Angeles County Museum of Natural History is from ARGENTINA, *Catamarca Prov.*, Andalgala, (J. L. Neff). Some or all were taken on flowers of *Abutilon virgatum* on March 14, 1973, and January 16, 1974. The holotype and allotype are in the Museo Argentina de Ciencias Naturales "Bernardino Rivadavia" (Buenos Aires), other type material is in the Snow Entomological Museum, University of Kansas.

Etymology.—*Microthurge boharti* is named in honor of R. M. Bohart.

Discussion.—This species could be *Microthurge corumbae* (Cockerell), **new combination**, the type of which I have not been able to locate. The description of *corumbae*, however, indicates a species with more abundant white hair and with the femora and first two metasomal segments dark ferruginous (Cockerell, 1901). These areas are black in *M. boharti*. Moreover, *M. corumbae* is from Corumbá, Mato Grosso, Brazil, which is in a moist tropical region, while *M. boharti* is from desertic areas farther south.

Micorthurge sp.?

Two small males (the smallest only 5 mm long) from Pocitos, Salta, Argentina, Nov. and Dec., 1956 (M. Fritz) may be conspecific with the male tentatively placed with *M. pharcidontus*. The supraclypeal area, however, lacks the two tubercles characteristic of that species.

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LITERATURE CITED

- Berthold, A. A. 1827. Latreille's natürliche Familien des Thierreichs mit Anmerkungen und Zusätzen. Weimar, 8 + 602 pp.
- Cockerell, T. D. A. 1901. Descriptions of new bees collected by Mr. H. H. Smith in Brazil—II. Proc. Acad. Nat. Sci. Philadelphia 53:216-222.
- . 1905. Notes on some bees in the British Museum. Trans. Amer. Ent. Soc. 31:309-364.
- Fox, W. J. 1902. *Lithurgopsis*, a new genus of bees. Ent. News 13:137-140.
- Friese, H. 1908. Die Apidae (Blumenwespen) von Argentina nach den Reiseergebnissen der Herren A. C. Jensen-Haarup und P. Jorgensen in den Jahren 1904-1907. Flora og Fauna 10:1-94.
- Hurd, P. D. 1979. Apoidea, pp. 1741-2209. In: K. V. Krombein, P. D. Hurd, D. R. Smith, and B. D. Burks, Catalog of Hymenoptera in America north of Mexico, vol. 2. Smithsonian Institution Press, Washington, D.C.
- Latreille, P. A. 1825. Familles naturelles du regne animal Paris, 570 pp.
- Lepelletier de St. Fargeau, A. [1828]. Encyclopedie Methodique. Insectes, vol. 10, pp. 345-832. Paris.
- Michener, C. D. 1944. Comparative external morphology, phylogeny, and a classification of the bees. Bull. Amer. Mus. Nat. Hist. 82:151-326.
- . 1951. Megachilidae, pp. 1136-1186. In: C. F. W. Muesebeck, K. V. Krombein, and H. Townes, Hymenoptera of America north of Mexico. Synoptic Catalog. U.S. Dept. Agric., Agric. Monog. 2.
- Moure, J. S. 1948. Notas sobre algunas abejas de Tacanas, Tucumán, Argentina. Rev. Ent. 19: 313-346.
- . 1949. Las especies chilenas de la sub-familia Lithurginae. Arq. Mus. Paranaense 7:265-286.
- Peters, D. S. 1972. Über die Stellung von *Aspidosmia* Brauns 1926 nebst allgemeinen Erörterungen der phylogenetischen Systematik der Megachilidae. Apidologie 3:167-186.
- Roberts, R. B. 1978. The nesting biology, behavior and immature stages of *Lithurge chrysurus*, an adventitious wood-boring bee in New Jersey. J. Kansas Ent. Soc. 51:735-745.
- Rozen, J. G., Jr. 1977. The ethology and systematic relationships of fideleine bees, including a description of the mature larva of *Parafidelia*. Amer. Mus. Novitates no. 2637:1-15.
- Sandhouse, G. A. 1943. The type species of the genera and subgenera of bees. Proc. U.S. Natl. Mus. 92:519-619.
- Snelling, R. (In press) The North American species of the bee genus *Lithurge*.